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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,818	01/30/2001	John G Gallagher	922-122	4604

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EXAMINER
SAINT SURIN, JACQUES M

ART UNIT	PAPER NUMBER
2856	7

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/744,818	GALLAGHER, JOHN G	
	Examiner	Art Unit	
	Jacques M Saint-Surin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2003 and 30 January 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Okumura et al. (US Patent 5,889,351) or Rudkin (US Patent 4,922,745).

Regarding claim 1, Okumura et al. ('351) discloses a sensor (viscosity measuring device equipped with a piezoelectric vibrator 10, see: Figs. 1, and 3-4 and col. 10, lines 33-37) comprising a mechanical resonator (piezoelectric element 20, see: col. 14, lines 21-22 and Figs. 3-4) including an element (frame 32) of which stiffness at least partially determines a modal shape of the resonance of the resonator and means for measuring a variation of a measure of the resonance as the stiffness of said element changes (a lead portion 16 is connected to a monitoring means 5 for detecting the vibration change of the piezoelectric element such as resonance frequency measuring means, see: col. 14, lines 27-30). Furthermore, Okumura et al. ('351) discloses a piezo-electric vibrator is vibrated in a fluid, and at this time, this vibrator suffers mechanical resistance on the basis of the viscosity of the fluid to change an electrical constant of a piezo-electric element constituting the vibrator, and this change of the electrical constant is detected to measure the viscosity of the fluid (see: col. 3, lines 60-67).

Regarding claims 2-3, Okumura et al. ('351) discloses two beams (pair of electrodes 14 connected by at least said element (piezoelectric vibrator 20). Regarding claim 3, Okumura discloses a yoke (bas plate lid 34, see: Figs. 3 and 4).

Regarding claim 4, Okumura discloses hollow 36 functions as a barrier for increasing the flow resistance of the fluid present in the hollow 36 in response to the vibration of the vibrator 10 and the vibrating plate (the first ceramic plate) 20, see: col. 14, lines 45-48.

Regarding claim 5, Okumura et al. ('351) discloses two sensing transducers piezoelectric vibrators 12 and 20).

Regarding claim 6, it is a method claim that recites the steps for performing the functions of the apparatus of claim 1. Therefore, it is rejected for the reasons set forth for claim 1. Furthermore, Okumura discloses an amplitude of vibration can be represented by A=F(m,r,c) (A is an amplitude of vibration) and the change of the characteristics of the fluid can be measured in connection with the change of the vibration of the piezo-electric element, see: col. 5, lines 47-50.

Regarding claims 7-10, Okumura ('351) discloses in measuring the viscosity, intensities of the elastic properties of the piezo-electric vibrator and the viscous resistance of the fluid are controlled so that the electrical constants of the piezo-electric element may change advantageously, see: col. 3, lines 66-67 and col. 4, lines 1-3. Furthermore, Okumura discloses this piezo-electric vibrator has suitable elastic properties in connection with the viscous resistance of the fluid whose viscosity is measured, here, "the elastic properties" means a degree of force which is applied to

the fluid by the vibration of the vibrator in the fluid, and for example, it is concerned with toughness, hardness, thickness and self vibration easiness of the piezo-electric element and on the other hand, "the viscous resistance" means a degree of force which the vibrator suffers from the fluid during the vibration of the vibrator in the fluid, and it is concerned with of the viscosity of the fluid (see: col. 6, lines 17-27).

Regarding claim 1, Rudkin et al. ('745) discloses a sensor (fluid transducer 10, see: Fig. 1) comprising a mechanical resonator (fork sensing element, see: col. 2, lines 36-37) including an element (yoke portion 11, see: Fig. 1 and col. 2, line 37) of which stiffness at least partially determines a modal shape of the resonance of the resonator (two vibratable tines 12, 14 extending therefrom in a substantially parallel relation ship, see: col. 2, lines 37-39) and means for measuring a variation of a measure of the resonance as the stiffness of said element changes (the transducer is arranged such that the tines are fully immersed in fluid to be metered, vibration is excited by energising the two excitation piezo-electric elements, one within each tine, and the two pick-up piezo-electric elements, again one within each tine, yield a signal representative of the vibratory behaviour of the fork structure, see: col. 2, lines 61-67 and col. 4, lines 48-52).

Regarding claim 2, Rudkin et al. ('745) et al. ('745) discloses a sensor (transducer 10) wherein the resonator comprises two beams (vibratable tines 12 and 14, see: Fig. 1) connected by at least said element (yoke 11, see: Fig. 1).

Regarding claim 3, Rudkin et al. ('745) discloses vibratable tines 12 and 14

Regarding claims 4-5, Rudkin et al. ('745) discloses tine 12 has a cavity in which two piezoelectric elements are similarly mounted to provide excitation and pick-up signals with respect to tine 12, see: col. 2, lines 57-60. Furthermore, col. 3 lines 7-11 discloses the effective mass of the tines is increased by an amount determined by the volume of fluid entrained by the moving section, thus the effect is related to fluid density, and a densimeter is provided. Regarding claim 5, rudkin discloses two piezoelectric elements 18 and 20, see: col. 2, lines 45-57.

Regarding claim 6, it is a method claim that recites the steps for performing the functions of the apparatus of claim 1. Therefore, it is rejected for the reasons set forth for claim 1.

Regarding claim 7, Rudkin et al. ('745) discloses a piezoelectrical element bonded to a structure at a point of changing strain will generate a signal representative of strain variation which may be recovered, see: col. 4, lines 62-65.

Regarding claims 8-10, Rudkin et al. ('745) discloses the phase difference between the excitation signal and pick up signal generally increases with viscosity, hence by arranging that phase circuit 52 acts to maintain a constant phase, viscosity sensitivity is reduced, see: col. 6, lines 51-68.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Belonenko et al. (US Patent 5,804,698) discloses a method and system for measuring fluid parameters by ultrasonic methods.

Ward (US Patent 4,644,796) discloses a pressure measurement apparatus and method.

Geen (US Patent 6,516,651) discloses Coriolis effect transducer.

Takeuchi et al. (US Patent 6,457,361) discloses mass sensor and mass sensing method.

Yoshimura et al. (US Patent 5,831,178) discloses vibration type measuring instrument.

Takeuchi et al. (US Patent 6,389,877) discloses double-headed mass sensor and mass detection method.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M Saint-Surin whose telephone number is (703) 308-3698. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Jacques M. Saint-Surin
March 2, 2003

HELEN KWOK
PRIMARY EXAMINER